

What is Claimed Is:

1. An inter-LAN communication device for controlling
inter-communication between a plurality of LAN segments

5 connected in a ring configuration, comprising:

LAN interface accommodation means for accommodating a
communication interface of said LAN segments;

traffic monitoring means for monitoring the traffic of
LAN data;

10 communication control means for controlling the
communication for inter-connecting a LAN segment of a local
node and a LAN segment of another node;

path selection means for switching a communication path
according to the instruction from the traffic monitoring
15 means; and

packet switch control means for switching the packeted
LAN data.

2. The inter-LAN communication device according to
20 Claim 1, wherein said communication control means further
includes a buffer which stores data transmitted from the LAN
segment, and said traffic monitoring means monitors traffic
by monitoring the capacity of said buffer which stores data
transmitted from the LAN segment.

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3. The inter-LAN communication device according to
Claim 1, wherein said traffic monitoring means monitors

traffic by monitoring the transmission intervals of data which are transmitted from the LAN segment.

4. The inter-LAN communication device according to
5 Claim 1, wherein said communication control means packets the LAN data by adding overhead which indicates the node numbers of a transmission source and a transmission destination.

5. The inter-LAN communication device according to
10 Claim 1, wherein said communication control means adds a sequence number for each packet at the transmission side so as to prevent a mismatch of the arrival sequence when the communication path is different for each packet due to path switching.

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6. The inter-LAN communication device according to
Claim 5, wherein said path control means adds a sequence number for each packet after said added node number at the transmission side so as to prevent a mismatch of the arrival
20 sequence when the communication path is different for each packet due to path switching.

7. The inter-LAN communication device according to
Claim 5, wherein said path control means matches the phases
25 of packets by referring to said sequence numbers and deleting said sequence numbers of the added information at the receiving side.

8. The inter-LAN communication device according to
Claim 1, wherein said packet switch control means further
includes an address learning part, which learns information
5 where the transmission source and transmission detection node
number information which is added to a packet sent from
another LAN segment, the transmission source and transmission
destination address information which the LAN data has, and
the communication port information which the packet switch
10 control means has, are associated and stores said association
information.

9. The inter-LAN communication device according to
Claim 8, wherein for the node numbers of the overhead to
15 indicate the transmission source and the transmission
destination in said communication control means, a local node
number which is preset, is added as the transmission source
node number and the node number which is derived by searching
and referring to said learned and stored association
20 information on the node numbers, communication ports and
addresses based on the transmission destination addresses
which the LAN data bus has, is added as the transmission
destination node number.

25 10. The inter-LAN communication device according to
Claim 8, wherein said packet switch control means compares
the local number, which is preset, and the transmission

destination node number of a packet sent from another node, which is another LAN segment, based on said learned and stored association information of the node numbers, ports and addresses, and the transmission destination packet is
5 received by the local node if the transmission destination node number is the same as the local node number, and a communication port is selected and the packet is transferred if the transmission destination node number is another node number.

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11. An inter-LAN communication system where communication is performed connecting a plurality of LAN segments, comprising:

a network,

15 an inter-LAN communication device which is installed at each one of a plurality of nodes of said network, and a LAN segment connected to said inter-LAN communication device, wherein

said inter-LAN communication device further comprises:

20 an interface which is common with the LAN segment to be connected,

means of monitoring traffic status of LAN data from said LAN segment,

an address learning part which learns and stores data
25 generated in one LAN segment based on said traffic status and routing information added to the LAN data from another LAN segment when the data is transferred to the other LAN segment,

and

packet switch control means for inter-connecting one LAN segment and the other LAN segment based on said learned and stored information.

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12. The inter-LAN communication system according to Claim 11, wherein said packet switch control means in the inter-LAN communication device installed in each one of the plurality of nodes of said network further comprises two communication ports, and band sharing type inter-communication between the plurality of LAN segments is implemented by the cascade connection of the band (path) in a ring format.

15 13. The inter-LAN communication system according to Claim 12, wherein said packet switch control means sets a fixed band path of a Point-to-Point connection between specified nodes, so as to guarantee a minimum access band between said nodes, and the band sharing path is used as a bypass route when traffic exceeds the band of said fixed band.

20 14. The inter-LAN communication system according to Claim 12, wherein said packet switch control means always transmits the packeted LAN data for transmission to the band sharing path when only the band sharing type path is used.

25 15. The inter-LAN communication system according to

Claim 12, wherein said network is a SONET/SDH system used for each band (path), and has a plurality of ring configurations.

16. The inter-LAN communication system according to
5 Claim 13, wherein said path control means normally sends the packeted LAN data for transmission to said fixed band path when the minimum access band guarantee type is used, and dynamically switches traffic to the band sharing path when said means of monitoring traffic notifies a band overflow of
10 said fixed band path.

17. An inter-LAN communication system which performs inter-communication between a plurality of LAN segments connected in a ring configuration, comprising:

15 a network,
an inter-LAN communication device which is installed in each one of the plurality of nodes of said network, and
a LAN segment which is connected to said inter-LAN communication device, wherein
20 said inter-LAN communication device further comprises:
LAN interface accommodating means for accommodating a communication interface of said LAN segment,
traffic monitoring means for monitoring traffic of LAN data,
25 communication control means for controlling communication to inter-connect the LAN segment of the local node and the LAN segment of another node,

path selection means for switching a communication path according to instructions from the traffic monitoring means, and

packet switch control means for switching said packeted LAN data.